What is claimed is:

1. A process for producing a polymeric actuator comprising an ion-exchange resin product and metal electrodes which are formed on the surface of the ion-exchange resin product and are insulated from each other, said actuator operating as an actuator by applying a potential difference between the metal electrodes when the ion-exchange resin product is in the water-containing state to allow the ion-exchange resin product to undergo bending or deformation,

wherein the following steps (i) to (iii) are repeatedly conducted to form the metal electrodes ranging from the surface of the ion-exchange resin product to the inside thereof;

(i) a step of allowing the ion-exchange resin product to adsorb a metal complex in an aqueous solution (adsorption step),

(ii) a step of reducing the metal complex adsorbed on the ion-exchange resin product by a reducing agent to deposit a metal on the surface of the ion-exchange resin product (deposition step), and

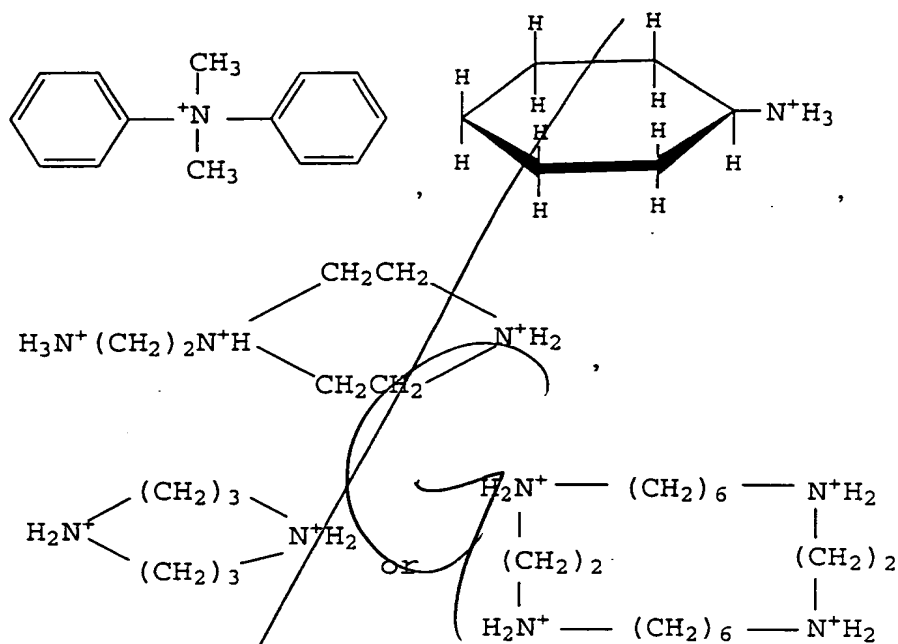(iii) a step of washing the ion-exchange resin product having the deposited metal (washing step).

2.   A polymeric actuator comprising an ion-exchange resin product containing an alkylammonium ion as a counter ion and metal electrodes which are formed on the surface of the ion-exchange resin product and are

5   insulated from each other, said polymeric actuator operating as an actuator ·by applying a potential difference between the metal electrodes when the ion-exchange resin product is in the water-containing state to allow the ion-exchange resin product to undergo

10   bending or deformation.

3.   The polymeric actuator as claimed in claim 2, wherein the alkylammonium ions are alkylammonium ions containing at least ions represented by the following

15   formula (1):

$$\left(R^2 - \underset{\underset{R^4}{\overset{R^1}{|}}}{\overset{|}{N}} - R^3 \right)^+ \qquad (1)$$

wherein R^1 to R^4 may be the same or different and are each a hydrogen atom, a hydrocarbon group, an oxygen-

20   containing hydrocarbon group or a nitrogen-containing hydrocarbon group, at least one of R^1 to R^4 is a group other than a hydrogen atom, and two or more of R^1 to R^4 may be bonded to form a ring.

4.   The polymeric actuator as claimed in claim 2, wherein the alkylammonium ion is represented by the following formula (1):
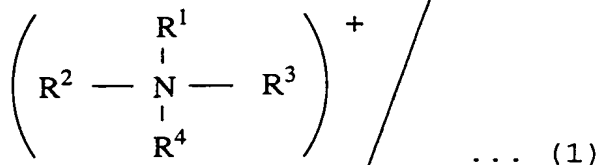
$$\left(R^2 - \underset{\underset{R^4}{|}}{\overset{\overset{R^1}{|}}{N}} - R^3 \right)^+ \quad \ldots (1)$$

wherein R^1 to R^4 may be the same or different and are each a hydrogen atom, a hydrocarbon group, an oxygen-containing hydrocarbon group or a nitrogen-containing hydrocarbon group, at least one of R^1 to R^4 is a group other than a hydrogen atom, and two or more of R^1 to R^4 may be bonded to form a ring.

5.   The polymeric actuator as claimed in ~~any one of claims~~ 2 ~~to 4,~~ wherein the ion represented by the formula (1) is $CH_3N^+H_3$, $C_2H_5N^+H_3$, $(CH_3)_2N^+H_2$, $(C_2H_5)_2N^+H_2$, $(C_4H_9)_2N^+H_2$, $(C_5H_{11})_2N^+H_2$, $(CH_3)_3N^+H$, $(C_2H_5)_3N^+H$, $(C_4H_9)_3N^+H$, $(C_5H_{11})_3N^+H$, $(CH_3)_4N^+$, $(C_2H_5)_4N^+$, $(C_3H_7)_4N^+$, $(C_4H_9)_4N^+$, $H_3N^+(CH_2)_4N^+H_3$, $H_2C=CHCH_2N^+HCH_3$, $H_3N^+(CH_2)_4N^+H_2(CH_2)_4N^+H_3$, $HC\equiv CCH_2N^+H_2$, $CH_3CH(OH)CH_2N^+H_3$, $H_3N^+(CH_2)_5OH$, $H_3N^+CH(CH_2OH)_2$, $(HOCH_2)_2C(CH_2N^+H_3)_2$, $C_2H_5OCH_2CH_2N^+H_3$,

$$\text{(C}_6\text{H}_5\text{)}\overset{\overset{\displaystyle CH_3}{|}}{\underset{\underset{\displaystyle CH_3}{|}}{N^+}}\text{(C}_6\text{H}_5\text{)}$$,

cyclohexyl–N^+H_3 ,

$$H_3N^+(CH_2)_2\overset{+}{N}H \begin{array}{c} CH_2CH_2 \\ \\ CH_2CH_2 \end{array} N^+H_2$$,

$$H_2N^+ \begin{array}{c} (CH_2)_3 \\ \\ (CH_2)_3 \end{array} N^+H_2$$

OR

$$\begin{array}{ccc} H_2N^+ \!\!-\!\! (CH_2)_6 \!\!-\!\! N^+H_2 \\ | \qquad\qquad\qquad | \\ (CH_2)_2 \qquad\qquad (CH_2)_2 \\ | \qquad\qquad\qquad | \\ H_2N^+ \!\!-\!\! (CH_2)_6 \!\!-\!\! N^+H_2 \end{array}$$.

add A1

add F2

add G2